

## CLAIMS

We claim:

- 5        1.     An antenna apparatus for detecting a leaked electromagnetic signal, the apparatus comprising:
- a telescoping antenna;
  - a casing including a first casing portion and a second casing portion, a portion of the antenna being mounted in the first casing portion, the  
10        antenna being telescopically moveably relative to the first casing portion between a substantially extended configuration, in which the antenna extends away from the first casing portion, and a substantially retracted configuration, in which the antenna is substantially housed in the first casing portion;
  - 15        - a signal analyzer disposed in the second casing portion, the signal analyzer being connected to the telescoping antenna, the electromagnetic signal being detected by the antenna and analyzed by the signal analyzer.
- 20        2.     The apparatus, according to claim 1, in which the telescoping antenna is a dipole antenna having two antenna poles, each pole having a first end and a second end, the first end of each pole being mounted end-to-end in the first casing portion.
- 25        3.     The antenna, according to claim 2, in which the first casing portion includes a first hollow end portion, a second hollow end portion and a dividing wall, the first ends of each pole being mounted respectively in the first and second hollow end portions, the dividing wall separating the hollow end portions.
- 30        4.     The antenna, according to claim 3, in which the first casing portion is generally tubular.

5. The apparatus, according to claim 3, in which the two poles, when in the extended configuration, have a length, which is generally half that of a wavelength of the electromagnetic signal.

6. The apparatus, according to claim 3, in which the first casing portion has a first axis and the second casing portion has a second axis, the first axis being orthogonal to the second axis, the first and second poles being aligned along the first axis.

7. The apparatus, according to claim 6, in which the first casing portion is made from a material transparent to the electromagnetic signal.

8. The apparatus, according to claim 1, in which the second casing portion includes a handle connected away from the antenna.

9. The apparatus, according to claim 3, in which the second ends of each pole include graduated markings.

10. The apparatus, according to claim 1, in which a sound level indicator is connected to the signal analyzer.

11. The apparatus, according to claim 1, in which the leaked signal is from a communications network.

12. The apparatus, according to claim 11, in which the communications network is a CATV network.

13. A leakage detector for detecting an electromagnetic signal leak in a communications network, the detector comprising:

- an antenna;
- a signal analyzer connected to the antenna, the electromagnetic signal being detected by the antenna and analyzed by the signal analyzer and converted to analyzed data;

- a control instrument in communication with the signal analyzer, the control instrument receiving an analyzed signal data from the signal analyzer.

14. The detector, according to claim 13, in which the control instrument is wirelessly connected to the antenna for receiving an analysis control command therefrom and transmitting the analyzed data thereto.

15. The detector, according to claim 13, in which the control instrument is electrically connected to the antenna.

16. The detector, according to claim 13, in which the control instrument is a PDA or an SLM.

17. The detector, according to claim 13, in which the antenna is mounted in a casing, the casing including a first casing portion and a second casing portion, a portion of the antenna being mounted in the first casing portion, the antenna being telescopically moveably relative to the first casing portion between a substantially extended configuration, in which the antenna extends away from the first casing portion, and a substantially retracted configuration, in which the antenna is substantially housed in the first casing portion.

18. The detector, according to claim 17, in which the antenna is a dipole antenna having two antenna poles, each pole having a first end and a second end, the first end of each pole being mounted end-to-end in the first casing portion.

19. A signal analysis method for analyzing an electromagnetic signal over a predetermined wide frequency band, the method comprising:

- digitally processing received electromagnetic signal data over a frequency band using mathematical transformation, the frequency band having a predetermined selectivity bandwidth increment into analyzed data, the predetermined selectivity bandwidth increment being smaller than the predetermined wide frequency band.

20. The method, according to claim 19, further includes:
- receiving the electromagnetic signal using a receiver.

- 5 21. The method, according to claim 19, further includes:
- performing a complex down-conversion of the received signal data into converted data.